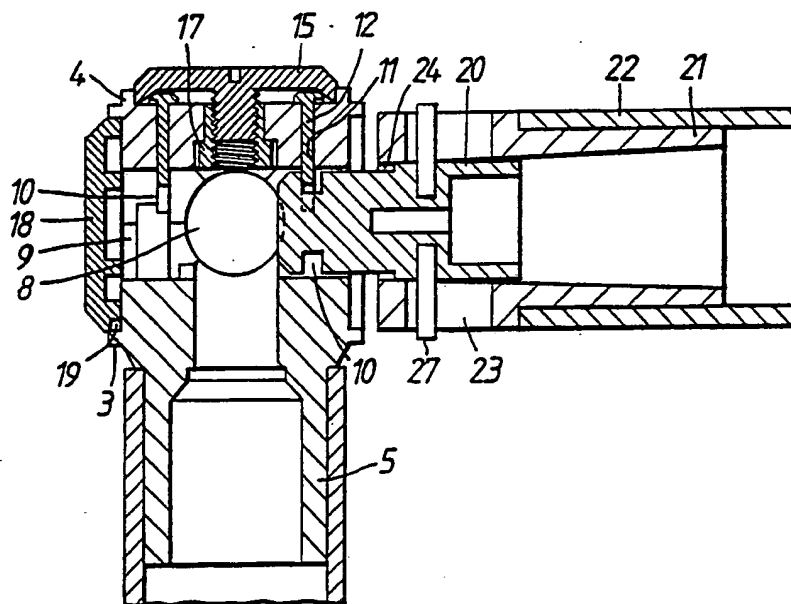


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁴ : E01F 13/00, E04H 17/14 F16B 7/00, 21/04	A1	(11) International Publication Number: WO 89/ 01544 (43) International Publication Date: 23 February 1989 (23.02.89)
(21) International Application Number: PCT/GB88/00680 (22) International Filing Date: 18 August 1988 (18.08.88) (31) Priority Application Number: 8719780 (32) Priority Date: 21 August 1987 (21.08.87) (33) Priority Country: GB (71) Applicant (for all designated States except US): NIM- LOK LIMITED [GB/GB]; 19a Floral Street, London WC2 9DS (GB). (72) Inventor; and (75) Inventor/Applicant (for US only) : GIBBONS, Martin [GB/GB]; 89 Woodham Lane, New Haw, Weybridge, Surrey KT15 3ND (GB). (74) Agents: BARDO, Julian, Eason et al.; Abel & Imray, Northumberland House, 303-306 High Holborn, Lon- don WC1V 7LH (GB).		(81) Designated States: AT (European patent), BE (Euro- pean patent), CH (European patent), DE (European patent), FR (European patent), GB, GB (European patent), IT (European patent), JP, LU (European pa- tent), NL (European patent), SE (European patent), US. Published <i>With international search report.</i>

(54) Title: BARRIER SYSTEM**(57) Abstract**

In a barrier system comprising an upright support, at least one barrier member (2) and a receiving member (1), the receiving member (1) is capable of being received at the upper end of an upright support, and has a plurality of open-ended passageways (10), the open ends of the passageways being spaced about the circumference of the receiving member (1). Each passageway has an engaging element (12) that projects into the passageway and is retractable therefrom independently of the engaging elements in the other passageways. Engaging means (25a) for co-operating with the engaging elements are provided on the end of the barrier member (2) so that the end of the barrier member can be secured releasably in the passageway (10). In use of the barrier system of the invention, an end of a barrier member (2) may be engaged in or released from a passageway (10) independently of any barrier members engaged in the other passageways.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	ML	Mali
AU	Australia	GA	Gabon	MR	Mauritania
BB	Barbados	GB	United Kingdom	MW	Malawi
BE	Belgium	HU	Hungary	NL	Netherlands
BG	Bulgaria	IT	Italy	NO	Norway
BJ	Benin	JP	Japan	RO	Romania
BR	Brazil	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	LI	Liechtenstein	SN	Senegal
CH	Switzerland	LK	Sri Lanka	SU	Soviet Union
CM	Cameroon	LU	Luxembourg	TD	Chad
DE	Germany, Federal Republic of	MC	Monaco	TG	Togo
DK	Denmark	MG	Madagascar	US	United States of America
FI	Finland				

- 1 -

Barrier system

The present invention relates to barrier systems of the type formed from a number of upright supports in which rigid or flexible transverse members such as rails or ropes extend between adjacent upright supports.
5 Barrier systems of this type are for example commonly used as barriers to control queues.

Because such barrier systems are frequently only temporary, it is desirable that they should be capable of being constructed and dismantled or rearranged quickly
10 and easily.

In one type of barrier system known in the prior art (British Specification No. 2102466B), an upright for a barrier system comprises a head member formed from a slotted member in which a plurality of slots open onto an
15 end face of the slotted member and a cap which can be fitted onto the slotted member to close off the ends of the slots. The head member can be connected to transverse members by fitments having an enlarged end and a narrow part adjacent thereto so that the fitment may be
20 slid into one of the slots from the open-end of the slot. When the cap is in position withdrawal of the fitment is prevented because the enlarged end is unable to pass through the slot. In this type of construction, however,
25 when the cap is lifted to allow removal of one fitment it is possible for one or more of the other fitments to

- 2 -

be dislodged accidentally at the same time.

In accordance with the present invention there is provided a barrier system in which the transverse barrier members are engageable in receiving members from which they may be released individually. Furthermore, the transverse barrier members can be connected to the receiving member quickly and simply.

The present invention provides a barrier system, comprising an upright support, at least one barrier member and a receiving member, the receiving member being capable of being received at the upper end of the upright support and having a plurality of passageways, each passageway having an open outer end through which an end of the barrier member can be inserted into the passageway, the passageways being arranged so that the open ends are spaced about the circumference of the receiving member and each passageway having an engaging element that projects into the passageway and is retractable therefrom independently of the engaging elements in the other passageways, engaging means for co-operating with the said engaging element being provided on the end of the barrier member so that the end of the barrier member can be secured releasably in the passageway.

The engaging means on the end of the barrier member may comprise a flange provided about the end of the barrier member the engaging element being capable of

- 3 -

releasably engaging the flange. The flange may be a continuous flange which surrounds the end of the barrier member. In an alternative embodiment of the invention the flange may be provided about a part, only, of the circumference of the end of the barrier member, the end of the barrier member being engageable with and releasable from the engaging element in the passageway by rotating the end of the barrier member. The barrier member preferably comprises an end-piece and a transverse member, the end-piece being secured to an end of the transverse member, and the end-piece including engaging means for cooperating with the engaging element so that the end of the barrier member can be secured releasably in each passageway. The transverse member may be a rigid transverse member or a flexible transverse member. In one aspect of the invention the transverse member is a rigid transverse member, the end-piece being capable of at least partial retraction into the transverse member, thus facilitating assembly of the barrier system when the end of the transverse member remote from the end-piece is in a fixed position.

In the barrier system according to the invention a barrier member may be engaged in or released from a passageway independently of any barrier members engaged in the other passageways. The receiving member may have, for example, four open-ended passageways each provided with a respective engaging element. Thus a receiving member

- 4 -

having four open-ended passageways may in an assembled barrier system cooperate with from one to four barrier members.

Preferably, the receiving member includes a cap
5 which is releasably fixable in a position that prevents retraction of the engaging elements. The cap prevents accidental release of barrier members after assembly.

The present invention further provides a barrier system according to the invention having a plurality of
10 receiving members, each receiving member being releasably mounted on an upright support.

Thus, in accordance with the invention there may be constructed a barrier system which comprises a plurality of receiving members, each receiving member
15 being mounted on an upright support, and each receiving member being connected to at least one adjacent receiving member by at least one barrier member. Each receiving member may be connected to the receiving member on the next upright in the series by means of a rigid or flexible
20 barrier member. One or more receiving members may be connected by a barrier member to a wall, means being provided on the wall for receiving an end of the barrier member.

The present invention further provides a receiving member comprising a plurality of passageways, each
25 passageway being open at an outer end and having an engaging element that projects into the passageway and is retractable therefrom independently of the engaging

- 5 -

elements in the other passageways for securing releasably in the passageway an end of a barrier member inserted through the open end of the passageway, the receiving member being suitable for use in a barrier system comprising a plurality of receiving members, each of which is mounted on an upright support, and each of which is connected to at least one adjacent receiving member by a transverse barrier member.

The invention will now be described with reference to the accompanying drawings, in which,

Fig. 1 shows an exploded view of one type of connecting device which may be used in a barrier system according to the invention including a receiving member and a connecting member suitable for use with a rigid tubular transverse member;

Fig. 2 shows a cross-section of the connecting device of Fig. 1 in the assembled condition;

Fig. 3 shows an end view of the connecting member of Fig. 1;

Fig. 4 shows a side view of another type of connecting member suitable for connecting a rope to the receiving member of Fig. 1;

Fig. 5 shows an end view of the connector of Fig. 4;

Fig. 6 shows one type of connecting device suitable for connecting a barrier member in a

- 6 -

barrier system of the invention to a wall;
Fig. 7 shows the device of Fig. 6 from above;
Fig. 8 shows a cross-section of the device of
Fig. 6 mounted on a wall;
5 Fig. 9 shows a perspective view of the device of
Fig. 1 in which a sign is mounted on the
device.

With reference to Figs. 1 and 2, one type of
connecting device suitable for use on an upright for a
10 barrier system using rigid or flexible transverse
barrier members comprises a receiving member 1. Figs. 1
and 2 show the receiving member 1 together with a
connecting member 2 which is suitable for a barrier
system using rigid transverse members. The receiving
15 member 1 comprises a lower body portion 3 and an upper
body portion 4. A tubular member 5 extends downwards
from the lower portion 3 and is so shaped that it is
capable of engaging a support column as shown in Fig. 2.
The lower portion 3 is provided with four projections 6
20 which, in the assembled device cooperate with
complementary recesses in the upper portion 4 to enhance
the locking together of the upper and lower portions
which are welded to one another.

The lower and upper portions 3, 4 together form
25 four identical vertical faces 7 and a cavity 8 between
the four faces 7. At a central position in each face 7

- 7 -

there is a circular aperture 9 defined by the upper and lower portions 3, 4. A passageway 10 of circular cross-section extends between each aperture 9 and the cavity 8, the aperture 9 defining an open outer end of the passageway.

As shown in Fig. 2, the upper portion 4 contains four slots 11, each of which runs from the upper surface of the upper portion 4 to the lower surface of that portion. The plane of each slot 11 is parallel to the plane of a face 7 at a central part of the face, the slot 11 being distanced slightly from the face. A substantially rectangular plate 12 fits loosely into each of the slots 11. Each plate has a shouldered part 13 on the top edge of the plate which is wider than the width of the respective slot so that when the plate is inserted into the slot the shouldered part 13 rests upon the top surface of the upper portion 4, so enabling the plate 12 to be lifted out of the slot using a screwdriver while preventing the upper edge of the plate from entering the slot 11.

A lower part of the plate 12 is cut away to form a curved edge 14 which defines part of a circle having a radius that is less than the radius of the passageway 10. When the plate 12 is inserted into a slot 11, the lower part of the plate projects into the passageway 10 reducing the cross-section of the passageway 10.

In the assembled receiving member a circular cap

- 8 -

15 fits over the top of the upper portion 4 covering the tops of the plates 12. The cap 15 has a central spigot 16 which is screw threadedly engageable in a receiving bushing 17 which is recessed in a position at the centre of the upper body portion 4. A circular side-cap 18 is capable of engaging in press-fit fashion with a circular recess 19 provided on each of the four faces 7, so that the aperture in the respective face is covered by the side-cap.

10 As will be clear from the above, the receiving member shown in Figs. 1 and 2 is capable of being used in conjunction with from one to four connecting members in which case the three to one apertures not being used for connecting purposes will normally be covered by side-caps 18.

One type of connecting member 2 that may be used in conjunction with a rigid transverse member and the receiving member shown in Figs. 1 and 2 is shown in those figures and in Fig. 3. The connecting member comprises an end-piece 20 and a tubular member 21. The tubular member 21 is so shaped that it is capable of engaging a rigid transverse member 22 in for example force-fit or twist-fit fashion. An end of the tubular member 21 comprises two side apertures 23 and an end aperture 24. The end-piece 20 is capable of retraction into the tubular member 21. The end-piece comprises engaging means having a part 25 of circular cross-section

- 9 -

which is so dimensioned that it can pass through the apertures 9 of the receiving member. A circular recess 26 is provided adjacent to the end of the part 25, so that the end of the part 25 provides a circular flange 25a.

5 The width of the recess is slightly larger than the thickness of the plates 12 of the head member. Projections 27 provided on the end-piece 20 protrude through the side apertures 23 and enable the part 25 to be retracted into the tubular member 21 through the end aperture 24.

10 In use, the connecting member 2 is engaged in a rigid transverse member 22. The cap 15 is removed from the body portion 4, and one of the plates 12 partially raised such that the lower part of the plate is withdrawn from the passageway. The end-piece 20 of the connecting
15 member 2 is then inserted into the passageway. If the end of the transverse member remote from the end-piece is fixed, assembly of the barrier system may be facilitated by retracting the end-piece into the transverse member by means of projections 27 and, when the transverse member
20 is in the desired position, causing the end-piece to return to its projecting position such that it enters the passageway 10 through aperture 9. The plate 12 is then released and drops into the slot 11 such that the lower part of plate 12 projects into the passageway and
25 engages in the recess 26 in the end-piece. The cap 15 is replaced so that the plate 12 is maintained in position so securing the end-piece and thence the barrier member in the engaged position.

- 10 -

Another type of connecting member that may be used in conjunction with the receiving member shown in Figs. 1 and 2 and which is suitable for use with a flexible barrier member is shown in Figs. 4 and 5. In this case the connecting member comprises two parts including an adapter 29 and an end-piece 33. An end of a rope 28 is retained within the adapter 29. The adapter has two arms 30, 31 which define between them a slot 32. The end-piece 33 comprises a flat part 34 which is held in position in the slot 32 by a bolt 35, and an engaging member 36, the end-piece being movable with respect to the adapter 29 by pivoting about the bolt 35. The engaging member comprises a first part 37 of circular cross-section which is so dimensioned that it will just fit through the apertures 9 of the receiving member, and a second part 38 which is of lesser cross-section than the first part 37 so that it will fit into a passageway when the plate 12 is inserted so as to partially obstruct the passageway. The second part 38 is provided with a semicircular flange 39 about the end of the second part which is further from the first part 37 so that if the end-piece is positioned in the passageway with the flange on the upper side it will be retained within the head member by the plates 12 but if it is rotated by 180° from that position it may be withdrawn.

In use, the end-piece of Figs. 4 and 5 may be connected to the receiving member without withdrawing the

- 11 -

plate 12 from the passageway 10. In this case the end-piece is rotated so that the flange 39 is on the lower side of the second part 38 of the engaging member 36. The engaging member is then inserted into the passageway 10 and rotated through 180° so that the flange 39 is on the upper side of the part 38 and the flange engages on the plate 12 which partially obstructs the passageway 10.

Figs. 6 and 7 show a wall bracket that may be used to secure a rigid or flexible member to a wall by means of an end piece of one of the types described above, and using a similar principle to that described above in relation to the receiving member 1. A bracket 40 has means 41 for fixing it to a wall. When fixed to the wall as shown in Fig. 8 the bracket provides a circular cylindrical flange 42 defining an aperture 43 capable of receiving the end-pieces described above. A top-piece 44 is a push fit into the space between the upper part of the bracket and the wall. The top-piece 44 has a flat plate member 45, the lower edge of which is formed with an arcuate recess, extending downwards so that it is capable of engaging the end-piece of a connecting member, for example, of the type shown in Figs. 1 to 3 or Figs. 4 and 5. The mode of action of the plate 45 is thus similar to that of the plates 12 described above in connection with the head member.

Barrier systems including the wall bracket of Figs. 6 and 7 may be assembled using rigid or flexible

- 12 -

members together with end-pieces of the type shown in Figs. 1 to 3 and in Figs. 4 and 5 respectively, the method of assembly in each case being analogous to that described above in connection with the receiving member 5 shown in Figs. 1 and 2.

A barrier system may be constructed using either barrier members having rigid transverse members, for example tubular metal pieces, or barrier members having flexible transverse members, for example rope. If 10 desired, the barrier system may include both rigid and flexible transverse members.

As shown in Fig. 9, the receiving member shown in Figs. 1 and 2 can also be used as a mounting means to carry for example signposts, when the connecting device 15 can be used in conjunction with an upright member and transverse members forming part of a barrier system, or with an upright member alone. When used as a mounting means, the cap 15 is replaced by a tube connector having an upper part 47 which fits into a sign support 48 and a 20 lower part that engages screw threadedly in the receiving member. The tube connector further comprises a cap 49 which covers the top of the receiving member when the tube connector is in position.

Claims:

1. A barrier system, comprising an upright support, at least one barrier member and a receiving member, the receiving member being capable of being received at the upper end of the upright support and having a plurality of passageways, each passageway having an open outer end through which an end of the barrier member can be inserted into the passageway, the passageways being arranged so that the open ends are spaced about the circumference of the receiving member and each passageway having an engaging element that projects into the passageway and is retractable therefrom independently of the engaging elements in the other passageways, engaging means for co-operating with the said engaging element being provided on the end of the barrier member so that the end of the barrier member can be secured releasably in the passageway.
2. A barrier system as claimed in claim 1, wherein the engaging means on the end of the barrier member comprises a flange provided about the end of the barrier member the engaging element being capable of releasably engaging the flange.
3. A barrier system as claimed in claim 2, wherein the flange is a continuous flange which surrounds the end of the barrier member.
4. A barrier system as claimed in claim 2, wherein

- 14 -

the flange is provided about a part, only, of the circumference of the end of the barrier member, the end of the barrier member being engageable with and releasable from the engaging element in the passageway by rotating the end of the barrier member.

5. A barrier system as claimed in any one of claims 1 to 4, wherein the barrier member comprises an end-piece and a transverse member, the end-piece being secured to an end of the transverse member, and the end-piece including engaging means for co-operating with the engaging element so that the end of the barrier member can be secured releasably in each passageway.

6. A barrier system as claimed in claim 5, wherein the transverse member is a rigid transverse member, the end-piece being capable of at least partial retraction into the transverse member.

7. A barrier system as claimed in any one of claims 1 to 6, wherein the receiving member comprises four open ended passageways each provided with a respective engaging element.

8. A barrier system as claimed in any one of claims 1 to 7, wherein the receiving member includes a cap which is releasably fixable in a position that prevents retraction of the engaging elements.

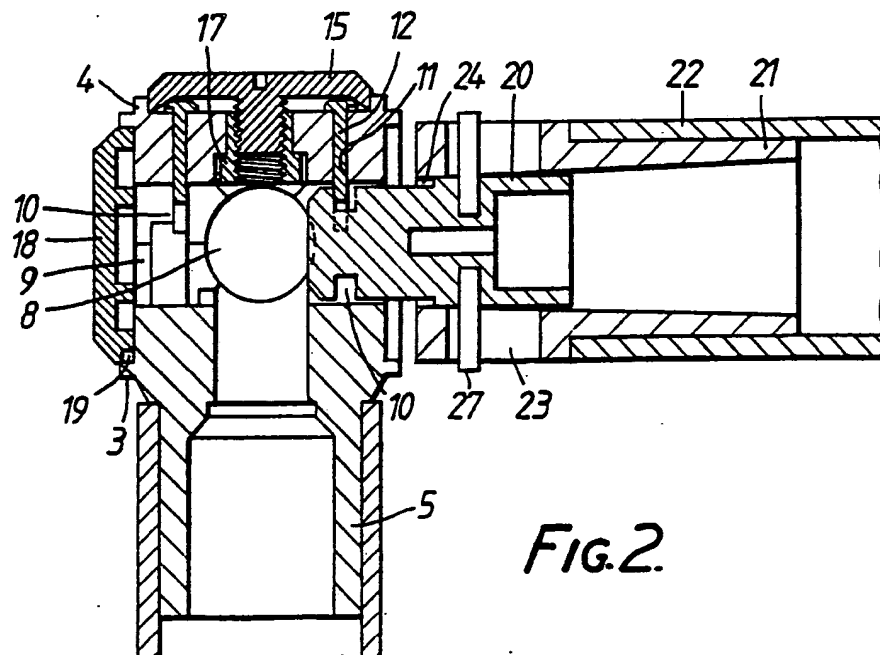
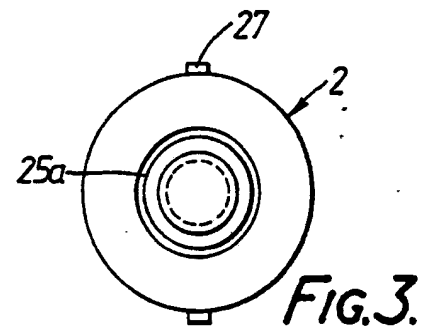
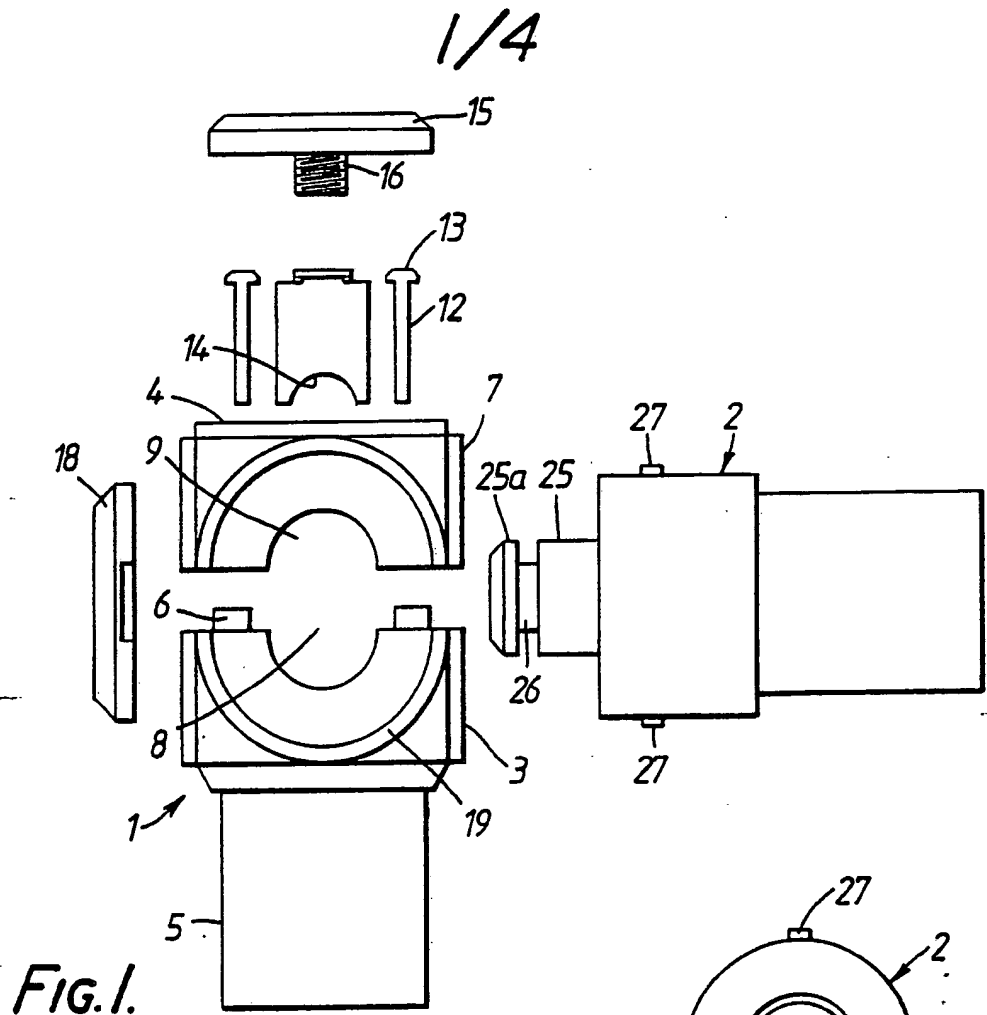
9. A barrier system as claimed in any one of claims 1 to 8, wherein the receiving member is releasably mounted on the upright support.

- 15 -

10. A barrier system as claimed in any one of claims 1 to 9, which comprises a plurality of receiving members, each receiving member being mounted on an upright support, and each receiving member being connected to at least one adjacent receiving member by at least one barrier member.

11. A barrier system as claimed in any one of claims 1 to 10, wherein a receiving member is connected by a barrier member to a wall, means being provided on the wall for receiving an end of the barrier member.

12. A receiving member comprising a plurality of passageways, each passageway being open at an outer end and having an engaging element that projects into the passageway and is retractable therefrom independently of the engaging elements in the other passageways for securing releasably in the passageway an end of a barrier member inserted through the open end of the passageway, the receiving member being suitable for use in a barrier system comprising a plurality of receiving members, each of which is mounted on an upright support, and each of which is connected to at least one adjacent receiving member by a transverse barrier member.



2/4

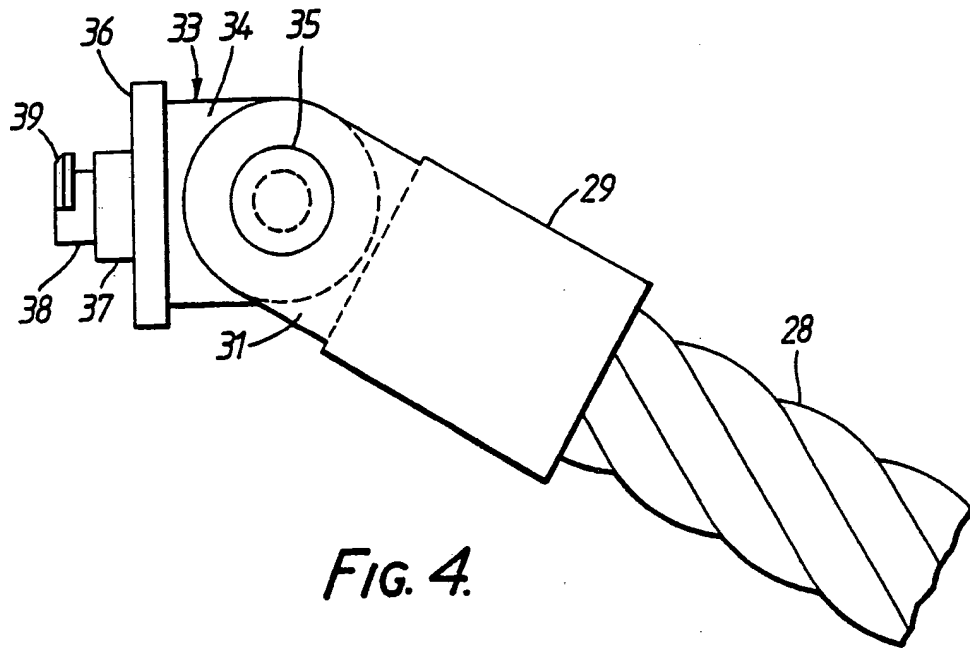


FIG. 4.

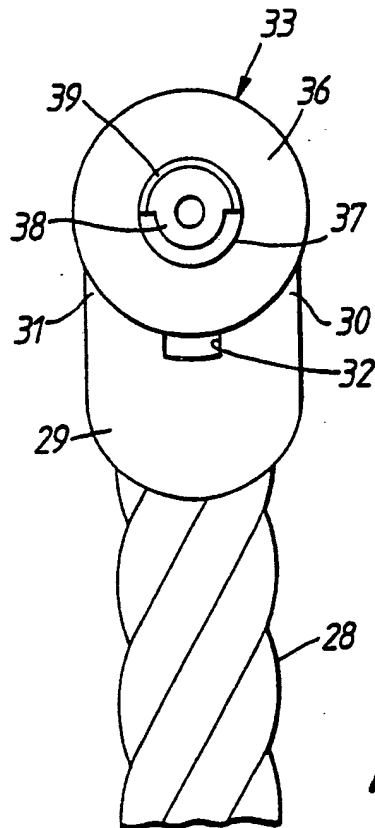


FIG. 5.

3/4

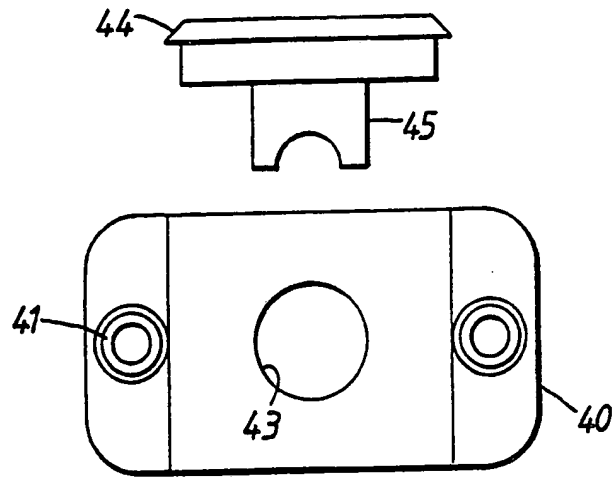


FIG. 6.

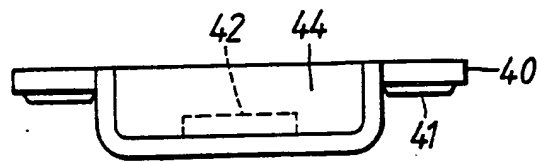


FIG. 7.

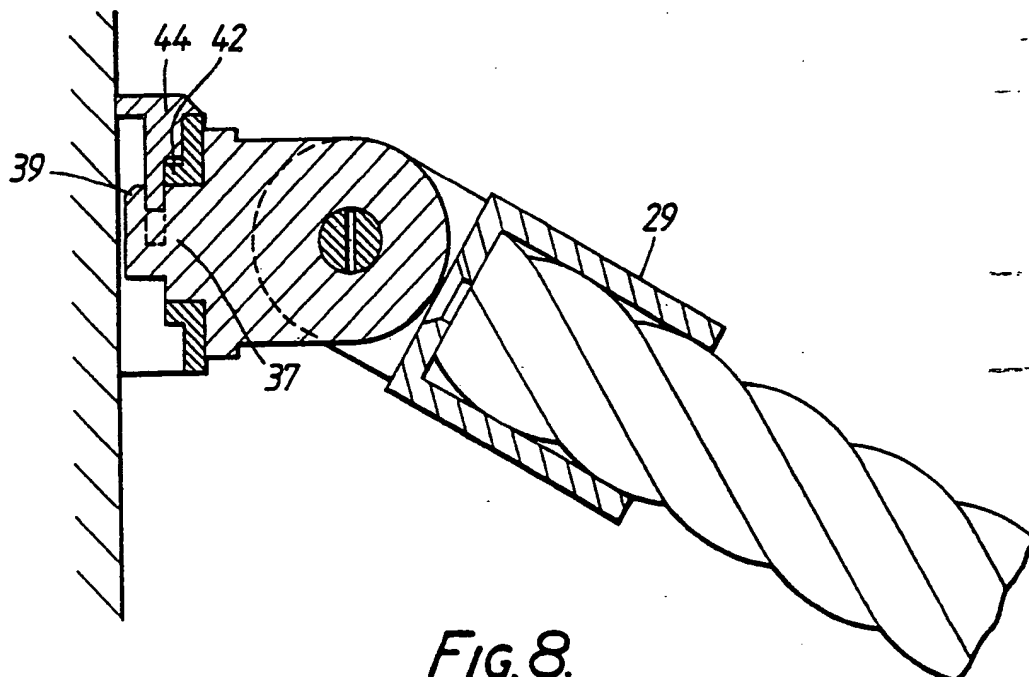


FIG. 8.

4/4

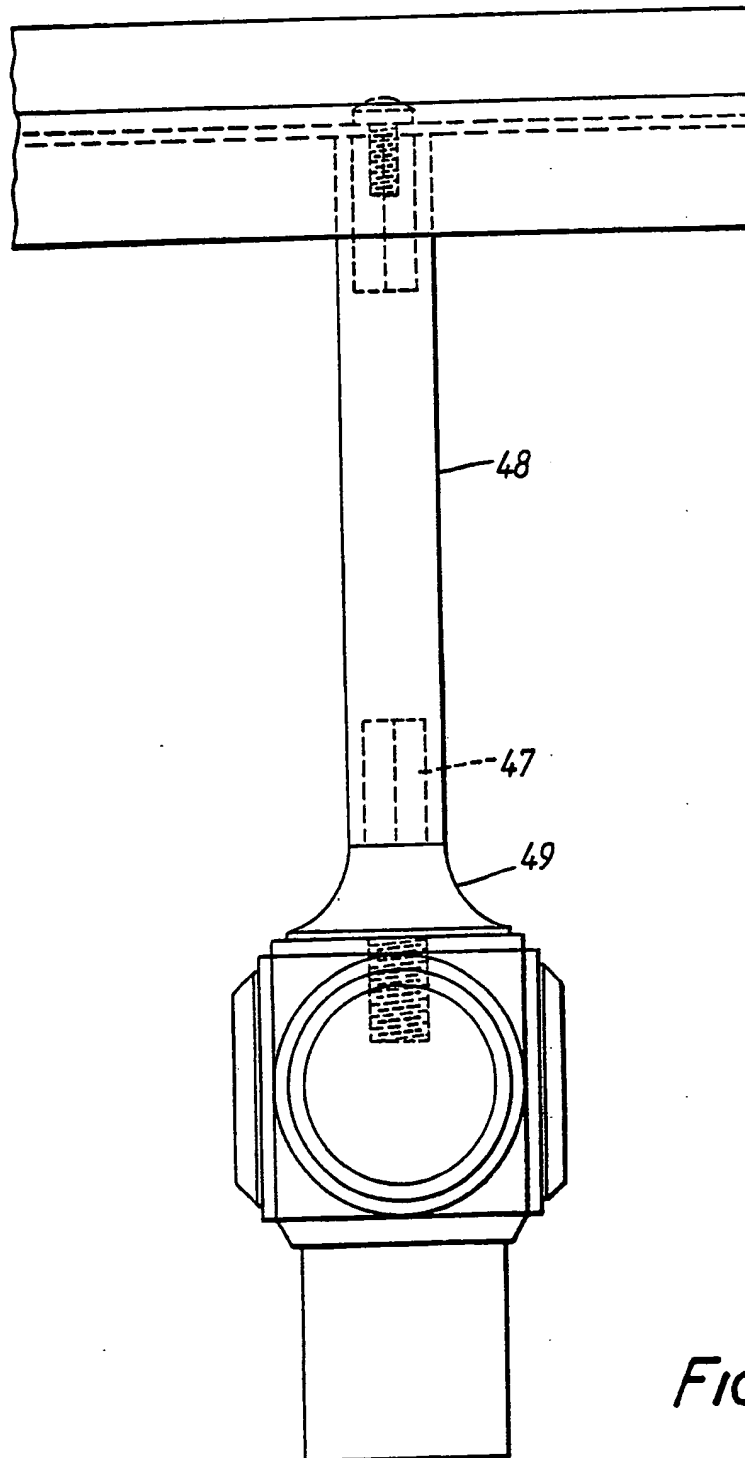


FIG. 9.

INTERNATIONAL SEARCH REPORT

International Application No **PCT/GB 88/00680**

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁴ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : E 01 F 13/00; E 04 H 17/14; F 16 B 7/00; F 16 B 21/04																													
II. FIELDS SEARCHED <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%; text-align: left; border-bottom: 1px solid black;">Classification System</th> <th style="width: 75%; text-align: left; border-bottom: 1px solid black;">Classification Symbols</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">IPC⁴</td> <td style="padding: 5px;">E 01 F; E 04 F; E 04 H</td> </tr> </table> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸</div>			Classification System	Classification Symbols	IPC ⁴	E 01 F; E 04 F; E 04 H																							
Classification System	Classification Symbols																												
IPC ⁴	E 01 F; E 04 F; E 04 H																												
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: left; padding: 5px;">Category ⁹</th> <th style="width: 70%; text-align: left; padding: 5px;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 20%; text-align: left; padding: 5px;">Relevant to Claim No. ¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">GB, A, 229571 (SPIKINGS) 26 February 1925 see page 1, lines 11,12,20-37; page 2, lines 10-16,29-44,50-61,68-71, 85-88, figures 1-3,6,7,10</td> <td style="vertical-align: top; padding: 5px;">1-3,5,6,8, 12</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="text-align: center; vertical-align: top; padding: 5px;">--</td> <td style="vertical-align: top; padding: 5px;">7,9,10</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">GB, A, 2004969 (PAASIAHO) 11 April 1979 see page 1, lines 4-11,36-41,79-101; figures 1,3</td> <td style="vertical-align: top; padding: 5px;">1-3,5,8, 12</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="text-align: center; vertical-align: top; padding: 5px;">--</td> <td style="vertical-align: top; padding: 5px;">6,10</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">GB, A, 2068499 (SECRETARY OF STATE FOR THE ENVIRONMENT) 12 August 1981 see page 1, lines 3-9,49-61,71-76, 107-113,116-118,125-127; page 2, lines 1-3,8-36,55-59; figure</td> <td style="vertical-align: top; padding: 5px;">1,5-8,12</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="text-align: center; vertical-align: top; padding: 5px;">--</td> <td style="vertical-align: top; padding: 5px;">2,3,9,10</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">FR, A, 2082497 (RISPAL) 10 December 1971 see page 1, lines 17-21,24-27; page 2, lines 10-17,21,22; page 3, lines</td> <td style="vertical-align: top; padding: 5px;">1,5,8,12</td> </tr> <tr> <td></td> <td style="text-align: right; padding: 5px;">./.</td> <td></td> </tr> </tbody> </table>			Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	Y	GB, A, 229571 (SPIKINGS) 26 February 1925 see page 1, lines 11,12,20-37; page 2, lines 10-16,29-44,50-61,68-71, 85-88, figures 1-3,6,7,10	1-3,5,6,8, 12	A	--	7,9,10	Y	GB, A, 2004969 (PAASIAHO) 11 April 1979 see page 1, lines 4-11,36-41,79-101; figures 1,3	1-3,5,8, 12	A	--	6,10	Y	GB, A, 2068499 (SECRETARY OF STATE FOR THE ENVIRONMENT) 12 August 1981 see page 1, lines 3-9,49-61,71-76, 107-113,116-118,125-127; page 2, lines 1-3,8-36,55-59; figure	1,5-8,12	A	--	2,3,9,10	Y	FR, A, 2082497 (RISPAL) 10 December 1971 see page 1, lines 17-21,24-27; page 2, lines 10-17,21,22; page 3, lines	1,5,8,12		./.	
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³																											
Y	GB, A, 229571 (SPIKINGS) 26 February 1925 see page 1, lines 11,12,20-37; page 2, lines 10-16,29-44,50-61,68-71, 85-88, figures 1-3,6,7,10	1-3,5,6,8, 12																											
A	--	7,9,10																											
Y	GB, A, 2004969 (PAASIAHO) 11 April 1979 see page 1, lines 4-11,36-41,79-101; figures 1,3	1-3,5,8, 12																											
A	--	6,10																											
Y	GB, A, 2068499 (SECRETARY OF STATE FOR THE ENVIRONMENT) 12 August 1981 see page 1, lines 3-9,49-61,71-76, 107-113,116-118,125-127; page 2, lines 1-3,8-36,55-59; figure	1,5-8,12																											
A	--	2,3,9,10																											
Y	FR, A, 2082497 (RISPAL) 10 December 1971 see page 1, lines 17-21,24-27; page 2, lines 10-17,21,22; page 3, lines	1,5,8,12																											
	./.																												
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>																													
IV. CERTIFICATION <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"> Date of the Actual Completion of the International Search 2nd November 1988 </td> <td style="width: 50%; padding: 5px;"> Date of Mailing of this International Search Report 30 NOV 1988 </td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"> International Searching Authority EUROPEAN PATENT OFFICE </td> <td style="padding: 5px;"> Signature of Authorized Officer P.C.G. VAN DER PUTTEN </td> </tr> </table>			Date of the Actual Completion of the International Search 2nd November 1988	Date of Mailing of this International Search Report 30 NOV 1988	International Searching Authority EUROPEAN PATENT OFFICE	Signature of Authorized Officer P.C.G. VAN DER PUTTEN																							
Date of the Actual Completion of the International Search 2nd November 1988	Date of Mailing of this International Search Report 30 NOV 1988																												
International Searching Authority EUROPEAN PATENT OFFICE	Signature of Authorized Officer P.C.G. VAN DER PUTTEN																												

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
	38-40; page 4, lines 1-13,34,35, 38-40; page 5, lines 1-17,19-23; figures 1,2,4-7	
A	--	6,10
Y	DE, A, 3331811 (REINHOLD) 28 February 1985 see page 5, lines 8,17-21; page 6, lines 7-10; page 8, line 24 - page 9, line 10; page 10, lines 1-20, 23-27; page 11, lines 16-18, 29, 30; page 12, lines 28-33; figures 1-3	6,7
A	--	1,5,10,12
X	GB, A, 462769 (GASCOIGNE) 15 April 1937 see page 1, lines 11-19; page 2, lines 1-6; figures 1,3	12
Y		1
A	--	5,6,9,10
A	GB, A, 2102466 (MARLER HALEY EXPOSYSTEMS) 2 February 1983 see page 1, lines 3-8,28-46; page 2, lines 18-39,62-94; page 3, lines 1,2,109-130; page 4, lines 1-3,42- 58; page 5, lines 60-72; figures 1a, 3,4,6-9 cited in the application	1,2,4-6, 8-12
Y	--	1
	US, A, 4149701 (DENSEN) 17 April 1979 see column 1, lines 6-9, and line 57 - column 2, line 5; figures 1,3	
A		5,6,8, 10,12
A	--	1,4-6,8, 10,12
	CH, A, 442402 (DEMANEGA) 31 January 1968 see column 2, lines 7-23, and line 34 - column 3, line 10; figures 1,2, 4-6	
A	--	1,5,6, 10,12
	GB, A, 1445843 (THE NORTH WESTERN ELECTRICITY BOARD) 11 August 1976 see page 1, lines 47-49,52-63,88, 89; page 2, lines 16-19,33-37, 59-66; figures 1-3	
A	--	1,5-7,9, 10,12
	FR, A, 2553813 (ATELIERS REUNIS) 26 April 1985 see page 1, lines 1-4,32-38; page 2, lines 1-3,24-26,33-37; page 3, lines 1-7,16-18; page 4, lines	./..

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
	lines 1-5,15-21; figures 1-5 --	
A	DE, A, 2907803 (DALEN) 11 September 1980 see page 4, lines 1-4; page 5, lines 27-31; page 6, lines 6-12; figures 1,2 --	1,5-7,10
A	DE, A, 1950569 (GEBR. KIRCHNER GITTER- ROSTFABRIK) 15 April 1971 see page 2, lines 1-13; page 5, lines 15-22; page 6, lines 14-20; figures 1,2 --	1,5,6
A	US, A, 3208730 (GREENFIELD) 28 September 1965 see column 2, lines 37-40, figures 3-5 -----	4

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

GB 8800680

SA 23729

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 18/11/88
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 229571		None	
GB-A- 2004969	11-04-79	DE-A- 2841901 SE-A- 7810136	12-04-79 04-04-79
GB-A- 2068499	12-08-81	None	
FR-A- 2082497	10-12-71	None	
DE-A- 3331811	28-02-85	None	
GB-A- 462769		None	
GB-A- 2102466	02-02-83	US-A- 4533122	06-08-85
US-A- 4149701	17-04-79	BE-A- 827947 NL-A- 7504978 FR-A- 2269622 DE-A- 2518900 CH-A- 582817 US-A- 4072294 GB-A- 1510482 CA-A- 1041337 SE-B- 410024 SE-A- 7503644	31-07-75 04-11-75 28-11-75 13-11-75 15-12-76 07-02-78 10-05-78 31-10-78 17-09-79 03-11-75
CH-A- 442402		None	
GB-A- 1445843	11-08-76	None	
FR-A- 2553813	26-04-85	None	
DE-A- 2907803	11-09-80	None	
DE-A- 1950569	15-04-71	DE-A- 1784007	18-11-71
US-A- 3208730		None	